### SEQUENCE LISTING

| <110> Aventis Pasteur Limited  |
|--|
| <120> Chlamydia antigens and corresponding DNA fragments and uses thereof  |
| <130> 77813-13   |
| <140> <141> <150> US 60/132,270  |
| <151> 1999-05-03   |
| <150> US 60/141,276<br><151> 1999-06-30  |
| <1,60> 14  |
| <170> PatentIn Ver. 2.0  |
| <210> 1<br><211> 2156<br><212> DNA   |
| <213> Chlamydia pneumoniae   |
| <220> <221> CDS <222> (101)(2053)  |
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| ataataaaac taaaagattt ttattatttt ttgagttttt atg gtt aat cct att 115<br>Met Val Asn Pro Ile   |
| ataataaaac taaaagattt ttattatttt ttgagttttt atg gtt aat cct att 115  Met Val Asn Pro Ile  1 5  ggt cca ggt cct ata gac gaa aca gaa cgc aca cct ccc gca gat ctt Gly Pro Gly Pro Ile Asp Glu Thr Glu Arg Thr Pro Pro Ala Asp Leu   |
| ataataaaac taaaagattt ttattatttt ttgagttttt atg gtt aat cct att 115  Met Val Asn Pro Ile 1 5  ggt cca ggt cct ata gac gaa aca gaa cgc aca cct ccc gca gat ctt Gly Pro Gly Pro Ile Asp Glu Thr Glu Arg Thr 15 Pro Pro Ala Asp Leu 10 15 20  tct gct caa gga ttg gag gcg agt gca gca aat aag agt gcg gaa gct Ser Ala Gln Gly Leu Glu Ala Ser Ala Ala Asn Lys Ser Ala Glu Ala   |
| ataataaaac taaaagattt ttattatttt ttgagttttt atg ggt aat cct att lis Met Val Asn Pro Ile 5  ggt cca ggt cct ata gac gaa aca gaa cgc aca cct ccc gca gat ctt lig Pro Gly Pro Ile Asp Glu Thr Glu Arg Thr Pro Pro Ala Asp Leu 20  tct gct caa gga ttg gag gcg agt gca gca aat aag agt gcg gaa gct leu Glu Ala Ser Ala Ala Asn Lys Ser Ala Glu Ala Glu Ala 25  caa aga ata gca ggt gcg gaa gct aag cct aaa gaa tct aag acc gat 259 Gln Arg Ile Ala Gly Ala Glu Ala Lys Pro Lys Glu Ser Lys Thr Asp |

| act<br>Thr        | agc<br>Ser        | aga<br>Arg        | tct<br>Ser        | gca<br>Ala<br>90  | Asp               | gtg<br>Val        | gac<br>Asp        | tca<br>Ser        | acg<br>Thr<br>95  | aca<br>Thr        | gcg<br>Ala        | acc<br>Thr        | gca<br>Ala        | cct<br>Pro<br>100 | acg<br>Thr        | 403  |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| cct<br>Pro        | cct<br>Pro        | cca<br>Pro        | ccc<br>Pro<br>105 | acg<br>Thr        | ttt<br>Phe        | gat<br>Asp        | gat<br>Asp        | tat<br>Tyr<br>110 | aag<br>Lys        | act<br>Thr        | caa<br>Gln        | gcg<br>Ala        | caa<br>Gln<br>115 | aca<br>Thr        | gct<br>Ala        | 451  |
| tac<br>Tyr        | gat<br>Asp        | act<br>Thr<br>120 | atc<br>Ile        | ttt<br>Phe        | acc<br>Thr        | tca<br>Ser        | aca<br>Thr<br>125 | tca<br>Ser        | cta<br>Leu        | gct<br>Ala        | gac<br>Asp        | ata<br>Ile<br>130 | cag<br>Gln        | gct<br>Ala        | gct<br>Ala        | 499  |
| ttg<br>Leu        | gtg<br>Val<br>135 | agc<br>Ser        | ctc<br>Leu        | cag<br>Gln        | gat<br>Asp        | gct<br>Ala<br>140 | gtc<br>Val        | act<br>Thr        | aat<br>Asn        | ata<br>Ile        | aag<br>Lys<br>145 | gat<br>Asp        | aca<br>Thr        | gcg<br>Ala        | gct<br>Ala        | 547  |
| act<br>Thr<br>150 | gat<br>Asp        | gag<br>Glu        | gaa<br>Glu        | acc<br>Thr        | gca<br>Ala<br>155 | atc<br>Ile        | gct<br>Ala        | gcg<br>Ala        | gag<br>Glu        | tgg<br>Trp<br>160 | gaa<br>Glu        | act<br>Thr        | aag<br>Lys        | aat<br>Asn        | gcc<br>Ala<br>165 | 595  |
| gat<br>Asp        | gca<br>Ala        | gtt<br>Val        | aaa<br>Lys        | gtt<br>Val<br>170 | ggc               | gcg<br>Ala        | caa<br>Gln        | att<br>Ile        | aca<br>Thr<br>175 | gaa<br>Glu        | tta<br>Leu        | gcg<br>Ala        | aaa<br>Lys        | tat<br>Tyr<br>180 | gct<br>Ala        | 643  |
| tcg<br>Ser        | gat<br>Asp        | aac<br>Asn        | caa<br>Gln<br>185 | gcg<br>Ala        | att<br>Ile        | ctt<br>Leu        | gac<br>Asp        | tct<br>Ser<br>190 | tta<br>Leu        | ggt<br>Gly        | aaa<br>Lys        | ctg<br>Leu        | act<br>Thr<br>195 | tcc<br>Ser        | ttc<br>Phe        | 691  |
| gac<br>Asp        | ctc<br>Leu        | tta<br>Leu<br>200 | cag<br>Gln        | gct<br>Ala        | gct<br>Ala        | ctt<br>Leu        | ctc<br>Leu<br>205 | caa<br>Gln        | tct<br>Ser        | gta<br>Val        | gca<br>Ala        | aac<br>Asn<br>210 | aat<br>Asn        | aac<br>Asn        | aaa<br>Lys        | 739  |
| gca<br>Ala        | gct<br>Ala<br>215 | gag<br>Glu        | ctt<br>Leu        | ctt<br>Leu        | aaa<br>Lys        | gag<br>Glu<br>220 | atg<br>Met        | caa<br>Gln        | gat<br>Asp        | aac<br>Asn        | cca<br>Pro<br>225 | gta<br>Val        | gtc<br>Val        | cca<br>Pro        | GJA<br>333        | 787  |
| aaa<br>Lys<br>230 | acg<br>Thr        | cct<br>Pro        | gca<br>Ala        | att<br>Ile        | gct<br>Ala<br>235 | caa<br>Gln        | tct<br>Ser        | tta<br>Leu        | gtt<br>Val        | gat<br>Asp<br>240 | cag<br>Gln        | aca<br>Thr        | gat<br>Asp        | gct<br>Ala        | aca<br>Thr<br>245 | 835  |
| gcg<br>Ala        | aca<br>Thr        | cag<br>Gln        | ata<br>Ile        | gag<br>Glu<br>250 | aaa<br>Lys        | gat<br>Asp        | gga<br>Gly        | aat<br>Asn        | gcg<br>Ala<br>255 | att<br>Ile        | agg<br>Arg        | gat<br>Asp        | gca<br>Ala        | tat<br>Tyr<br>260 | ttt<br>Phe        | 883  |
| gca<br>Ala        | gga<br>Gly        | cag<br>Gln        | aac<br>Asn<br>265 | gct<br>Ala        | agt<br>Ser        | gga<br>Gly        | gct<br>Ala        | gta<br>Val<br>270 | gaa<br>Glu        | aat<br>Asn        | gct<br>Ala        | aàa<br>Lys        | tct<br>Ser<br>275 | aat<br>Asn        | aac<br>Asn        | 931  |
| agt<br>Ser        | ata<br>Ile        | agc<br>Ser<br>280 | Asn               | ata<br>Ile        | gat<br>Asp        | tca<br>Ser        | gct<br>Ala<br>285 | aaa<br>Lys        | gca<br>Ala        | gca<br>Ala        | atc<br>Ile        | gct<br>Ala<br>290 | act<br>Thr        | gct<br>Ala        | aag<br>Lys        | 979  |
|                   |                   |                   |                   |                   |                   | cag<br>Gln<br>300 |                   |                   |                   |                   |                   |                   |                   |                   |                   | 1027 |

| caa<br>Gln<br>310 | gaa<br>Glu        | gcg<br>Ala              | gaa<br>Glu        | caa<br>Gln        | atg<br>Met<br>315       | gta<br>Val        | ata<br>Ile        | cag<br>Gln        | gct<br>Ala        | gag<br>Glu<br>320 | aaa<br>Lys        | gat<br>Asp        | ctt<br>Leu        | aaa<br>Lys        | aat<br>Asn<br>325 | 1075 |
|-------------------|-------------------|-------------------------|-------------------|-------------------|-------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| atc<br>Ile        | aaa<br>Lys        | cct <sub>.</sub><br>Pro | gca<br>Ala        | gat<br>Asp<br>330 | ggt<br>Gly              | tct<br>Ser        | gat<br>Asp        | gtt<br>Val        | cca<br>Pro<br>335 | aat<br>Asn        | cca<br>Pro        | gga<br>Gly        | act<br>Thr        | aca<br>Thr<br>340 | gtt<br>Val        | 1123 |
| gga<br>Gly        | ggc               | tcc<br>Ser              | aag<br>Lys<br>345 | caa<br>Gln        | caa<br>Gln              | gga<br>Gly        | agt<br>Ser        | agt<br>Ser<br>350 | att<br>Ile        | ggt               | agt<br>Ser        | att<br>Ile        | cgt<br>Arg<br>355 | gtt<br>Val        | tcc<br>Ser        | 1171 |
| atg<br>Met        | ctg<br>Leu        | tta<br>Leu<br>360       | gat<br>Asp        | gat<br>Asp        | gct <sup>.</sup><br>Ala | gaa<br>Glu        | aat<br>Asn<br>365 | gag<br>Glu        | acc<br>Thr        | gct<br>Ala        | tcc<br>Ser        | att<br>Ile<br>370 | ttg<br>Leu        | atg<br>Met        | tct<br>Ser        | 1219 |
| ejy<br>aaa        | ttt<br>Phe<br>375 | cgt<br>Arg              | cag<br>Gln        | atg<br>Met        | att<br>Ile              | cac<br>His<br>380 | atg<br>Met        | ttc<br>Phe        | aat<br>Asn        | acg<br>Thr        | gaa<br>Glu<br>385 | aat<br>Asn        | cct<br>Pro        | gat<br>Asp        | tct<br>Ser        | 1267 |
| caa<br>Gln<br>390 | gct<br>Ala        | gcc<br>Ala              | caa<br>Gln        | cag<br>Gln        | gag<br>Glu<br>395       | ctc<br>Leu        | gca<br>Ala        | gca<br>Ala        | caa<br>Gln        | gct<br>Ala<br>400 | aga<br>Arg        | gca<br>Ala        | gcg<br>Ala        | aaa<br>Lys        | gcc<br>Ala<br>405 | 1315 |
| gct.<br>Ala       | gga.<br>Gly       | gat<br>Asp              | gac<br>Asp        | agt<br>Ser<br>410 | gct                     | gct<br>Ala        | .gca<br>Ala       | gcg<br>Ala        | ctg<br>Leu<br>415 | gca<br>Ala        | gat<br>Asp        | gct<br>Ala        | cag<br>Gln        | aaa<br>Lys<br>420 | gct<br>Ala        | 1363 |
| tta<br>Leu        | gaa<br>Glu        | gcg<br>Ala              | gct<br>Ala<br>425 | cta<br>Leu        | ggt<br>Gly              | aaa<br>Lys        | gct<br>Ala        | 999<br>Gly<br>430 | caa<br>Gln        | caa<br>Gln        | cag<br>Gln        | ggc<br>Gly        | ata<br>Ile<br>435 | ctc<br>Leu        | aat<br>Asn        | 1411 |
| gct<br>Ala        | tta<br>Leu        | gga<br>Gly<br>440       | Gln               | atc<br>Ile        | gct<br>Ala              | tct<br>Ser        | gct<br>Ala<br>445 | gct<br>Ala        | gtt<br>Val        | gtg<br>Val        | agc<br>Ser        | gca<br>Ala<br>450 | gga<br>Gly        | gtt<br>Val        | cct<br>Pro        | 1459 |
| ccc<br>Pro        | gct<br>Ala<br>455 | Ala                     | gca<br>Ala        | ägt<br>Ser        | tct<br>Ser              | ata<br>Ile<br>460 | Gly<br>aaa        | tca<br>Ser        | tct<br>Ser        | gta<br>Val        | aaa<br>Lys<br>465 | Gln               | ctt<br>Leu        | tac<br>Tyr        | aag<br>Lys        | 1507 |
| acc<br>Thr<br>470 | Ser               | aaa<br>Lys              | tct<br>Ser        | aca<br>Thr        | ggt<br>Gly<br>475       |                   | gat<br>Asp        | tat<br>Tyr        | aaa<br>Lys        | aca<br>Thr<br>480 | Gln               | ata<br>Ile        | tca<br>Ser        | gca<br>Ala        | ggt<br>Gly<br>485 | 1555 |
| tat<br>Tyr        | gat<br>Asp        | gct<br>Ala              | tac<br>Tyr        | aaa<br>Lys<br>490 | Ser                     | atc<br>Ile        | aat<br>Asn        | gat<br>Asp        | gco<br>Ala<br>495 | Tyr               | ggt<br>Gly        | agg<br>Arg        | gca<br>Ala        | cga<br>Arg<br>500 | Asn               | 1603 |
| gat<br>Asp        | gcg<br>Ala        | act<br>Thr              | cgt<br>Arg        | Asp               | gtg<br>Val              | ata<br>Ile        | aac<br>Asn        | aat<br>Asn<br>510 | val               | agt<br>Ser        | acc<br>Thr        | e ccc<br>Pro      | gct<br>Ala<br>515 | Leu               | aca<br>Thr        | 1651 |
| cga<br>Arg        | tco<br>Ser        | gtt<br>Val<br>520       | Pro               | aga<br>Arg        | gca<br>Ala              | cga<br>Arg        | aca<br>Thr        | Glu               | gct<br>Ala        | cgs               | a gga<br>g Gly    | e cca<br>Pro      | Glu               | aaa<br>Lys        | aca<br>Thr        | 1699 |

| gat<br>Asp        | caa<br>Gln<br>535                | gcc<br>Ala        | ctc<br>Leu        | gct<br>Ala        | agg<br>Arg        | gtg<br>Val<br>540 | att<br>Ile        | tct<br>Ser        | ggc<br>Gly        | aat<br>Asn        | agc<br>Ser<br>545 | aga<br>Arg        | act<br>Thr        | ctt<br>Leu        | gga<br>Gly        | 1 <b>74</b> 7 |
|-------------------|----------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------|
| gat<br>Asp<br>550 | gtc<br>Val                       | tat.<br>Tyr       | agt<br>Ser        | caa<br>Gln        | gtt<br>Val<br>555 | tcg<br>Ser        | gca<br>Ala        | cta<br>Leu        | caa<br>Gln        | tct<br>Ser<br>560 | gta<br>Val        | atg<br>Met        | cag<br>Gln        | atc<br>Ile        | atc<br>Ile<br>565 | 1795          |
| cag<br>Glr        | tcg                              | aat<br>Asn        | cct<br>Pro        | caa<br>Gln<br>570 | gcg<br>Ala        | aat<br>Asn        | aat<br>Asn        | gag<br>Glu        | gag<br>Glu<br>575 | Ile               | aga<br>Arg        | caa<br>Gln        | aag<br>Lys        | ctt<br>Leu<br>580 | aca<br>Thr        | 1843          |
| t co<br>Ser       | gca<br>Ala                       | gtg<br>Val        | aca<br>Thr<br>585 | aag<br>Lys        | cct<br>Pro        | cca<br>Pro        | cag<br>Gln        | ttt<br>Phe<br>590 | ggc<br>Gly        | tat<br>Tyr        | cct<br>Pro        | tat<br>Tyr        | gtg<br>Val<br>595 | caa<br>Gln        | ctt<br>Leu        | 1891          |
| tct<br>Ser        | aat<br>Asn                       | gac<br>Asp<br>600 | tct<br>Ser        | aca<br>Thr        | cag<br>Gln        | aag<br>Lys        | ttc<br>Phe<br>605 | ata<br>Ile        | gct<br>Ala        | aaa<br>Lys        | tta<br>Leu        | gaa<br>Glu<br>610 | agt<br>Ser        | ttg<br>Leu        | ttt<br>Phe        | 1939          |
| gct<br>Ala        | gaa<br>Glu<br>615                | gga<br>Gly        | tct<br>Ser        | agg<br>Arg        | aca<br>Thr        | gca<br>Ala<br>620 | gct<br>Ala        | gaa<br>Glu        | ata<br>Ile        | aaa<br>Lys        | gca<br>Ala<br>625 | ctt<br>Leu        | tcc<br>Ser        | ttt<br>Phe        | gaa<br>Glu        | 1987          |
| acg<br>Thr        | aac<br>Asn                       | tcc<br>Ser        | ttg<br>Leu        | ttt<br>Phe        | att<br>Ile<br>635 | cag<br>Gln        | cag<br>Gln        | gtg<br>Val        | ctg<br>Leu        | gtc<br>Val<br>640 | aat<br>Asn        | atc<br>Ile        | ggc               | tct<br>Ser        | cta<br>Leu<br>645 | 2035          |
|                   | tct<br>Ser                       |                   |                   |                   |                   | taad              | caaca             | acc t             | aagt              | tgtt              | eg ti             | tgg               | agaga             | a                 |                   | 2083          |
| tta               | ttat                             | gtg (             | ettt              | ggta              | ag go             | cttt              | tgttg             | gag               | gccti             | tacc              | aaca              | acact             | tag a             | aacga             | atcttc            | 2143          |
| aat               | aaat                             | aaa a             | aga               |                   |                   | :                 |                   |                   |                   | •                 |                   |                   |                   |                   |                   | 2156          |
|                   |                                  | •                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |               |
| <2:               | 10> 2<br>11> 6<br>12> P<br>13> C | RT                | ydia              | pne               | umon:             | iae               | •                 |                   |                   |                   |                   |                   |                   |                   | •                 |               |
| <40               | 00> 2                            |                   |                   |                   |                   |                   | _                 |                   |                   |                   |                   | _1                |                   |                   |                   |               |
|                   | Val                              | Asn               | Pro               | Ile<br>5          |                   | Pro               | Gly               | Pro               | Ile<br>10         | Asp               | Glu               | Inr               | GIU               | arg<br>15         | Thr               |               |
| Pro               | Pro                              | Ala               | Asp<br>20         |                   | Ser               | Ala               | Gln               | Gly<br>25         | Leu               | Glu               | Ala               | Ser               | Ala<br>30         | Ala               | Asn               |               |
| Ly                | s Ser                            | Ala<br>35         |                   | Ala               | Gln               | Arg               | Ile<br>40         | Ala               | Gly               | Ala               | Glu               | Ala<br>45         | Lys               | Pro               | Lys               |               |
| Gl                | ser<br>50                        | _                 | Thr               | Asp               | Ser               | Val<br>55         | Glu               | Arg               | Trp               | Ser               | Ile<br>60         | Leu               | Arg               | Ser               | Ala               |               |

Val Asn Ala Leu Met Ser Leu Ala Asp Lys Leu Gly Ile Ala Ser Ser Asn Ser Ser Ser Ser Thr Ser Arg Ser Ala Asp Val Asp Ser Thr Thr Ala Thr Ala Pro Thr Pro Pro Pro Pro Thr Phe Asp Asp Tyr Lys Thr 105 Gln Ala Gln Thr Ala Tyr Asp Thr Ile Phe Thr Ser Thr Ser Leu Ala 115 Asp Ile Gln Ala Ala Leu Val Ser Leu Gln Asp Ala Val Thr Asn Ile 135 Lys Asp Thr Ala Ala Thr Asp Glu Glu Thr Ala Ile Ala Ala Glu Trp 150 Glu Thr Lys Asn Ala Asp Ala Val Lys Val Gly Ala Gln Ile Thr Glu Leu Ala Lys Tyr Ala Ser Asp Asn Gln Ala Ile Leu Asp Ser Leu Gly Lys Leu Thr Ser Phe Asp Leu Leu Gln Ala Leu Leu Gln Ser Val 200 Ala Asn Asn Asn Lys Ala Ala Glu Leu Leu Lys Glu Met Gln Asp Asn Pro Val Val Pro Gly Lys Thr Pro Ala Ile Ala Gln Ser Leu Val Asp 230-Gln Thr Asp Ala Thr Ala Thr Gln Ile Glu Lys Asp Gly Asn Ala Ile 250 Arg Asp Ala Tyr Phe Ala Gly Gln Asn Ala Ser Gly Ala Val Glu Asn Ala Lys Ser Asn Asn Ser Ile Ser Asn Ile Asp Ser Ala Lys Ala Ala 280 Ile Ala Thr Ala Lys Thr Gln Ile Ala Glu Ala Gln Lys Lys Phe Pro 295 Asp Ser Pro Ile Leu Gln Glu Ala Glu Gln Met Val Ile Gln Ala Glu 310 Lys Asp Leu Lys Asn Ile Lys Pro Ala Asp Gly Ser Asp Val Pro Asn 330

Pro Gly Thr Thr Val Gly Gly Ser Lys Gln Gln Gly Ser Ser Ile Gly

Ser Ile Arg Val Ser Met Leu Leu Asp Asp Ala Glu Asn Glu Thr Ala 355 360 365

Ser Ile Leu Met Ser Gly Phe Arg Gln Met Ile His Met Phe Asn Thr 370 375 380

Glu Asn Pro Asp Ser Gln Ala Ala Gln Gln Glu Leu Ala Ala Gln Ala 385 390 395 400

Arg Ala Ala Lys Ala Ala Gly Asp Asp Ser Ala Ala Ala Ala Leu Ala 405 410 415

Asp Ala Gln Lys Ala Leu Glu Ala Ala Leu Gly Lys Ala Gly Gln Gln
420 425 430

Gln Gly Ile Leu Asn Ala Leu Gly Gln Ile Ala Ser Ala Ala Val 435 440 445

Ser Ala Gly Val Pro Pro Ala Ala Ala Ser Ser Ile Gly Ser Ser Val 450 455 460

Lys Gln Leu Tyr Lys Thr Ser Lys Ser Thr Gly Ser Asp Tyr Lys Thr 465 470 475 480

Gln Ile Ser Ala Gly Tyr Asp Ala Tyr Lys Ser Ile Asn Asp Ala Tyr 485 490 495

Gly Arg Ala Arg Asn Asp Ala Thr Arg Asp Val Ile Asn Asn Val Ser 500 505 510

Thr Pro Ala Leu Thr Arg Ser Val Pro Arg Ala Arg Thr Glu Ala Arg
515 520 525

Gly Pro Glu Lys Thr Asp Gln Ala Leu Ala Arg Val Ile Ser Gly Asn 530 535 540

Ser Arg Thr Leu Gly Asp Val Tyr Ser Gln Val Ser Ala Leu Gln Ser 545 550 555

Val Met Gln Ile Ile Gln Ser Asn Pro Gln Ala Asn Asn Glu Glu Ile 565 570 575

Arg Gln Lys Leu Thr Ser Ala Val Thr Lys Pro Pro Gln Phe Gly Tyr 580 585 590

Pro Tyr Val Gln Leu Ser Asn Asp Ser Thr Gln Lys Phe Ile Ala Lys 595 600 605

Leu Glu Ser Leu Phe Ala Glu Gly Ser Arg Thr Ala Ala Glu Ile Lys 610 615 620

Ala Leu Ser Phe Glu Thr Ash Ser Leu Phe Ile Gln Gln Val Leu Val 625 630 635 640 Asn Ile Gly Ser Leu Tyr Ser Gly Tyr Leu Gln 645 650

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| <211<br><212<br><213<br><220 | ><br>> DN         | lamy<br>42        | dia               | pneu              | ımoni             | ae                |                   |                   |                        |                   |                   |                   |                   |                   |                   |     |
| <222                         | > (1              | .01               | (205              | 3)                |                   |                   |                   |                   |                        |                   |                   |                   |                   |                   |                   | *   |
| <400<br>atg<br>Met           | agt               | ctg<br>Leu        | gca<br>Ala        | gat<br>Asp<br>5   | aag<br>Lys        | ctg<br>Leu        | ggt<br>Gly        | att<br>Ile        | gct<br>Ala<br>10       | tct<br>Ser        | agt<br>Ser        | aac<br>Asn        | agc<br>Ser        | tög<br>Ser<br>15  | tct<br>Ser        | 48  |
| tct<br>Ser                   | act<br>Thr        | agc<br>Ser        | aga<br>Arg<br>20  | tct<br>Ser        | gca<br>Ala        | gac<br>Asp        | gtg<br>Val        | gac<br>Asp<br>25  | tca<br>Ser             | acg<br>Thr        | aca<br>Thr        | gcg<br>Ala        | acc<br>Thr<br>30  | gca<br>Ala        | cct<br>Pro        | 96  |
| acg<br>Thr                   | cct<br>Pro        | cct<br>Pro<br>35  | cca<br>Pro        | ccc<br>Pro        | acg<br>Thr        | ttt<br>Phe        | gat<br>Asp<br>40  | gat<br>Asp        | tát<br>Tyr             | aag<br>Lys        | act<br>Thr        | caa<br>Gln<br>45  | gcg<br>Ala        | caa<br>Gln        | aca<br>Thr        | 144 |
| gct<br>Ala                   | tac<br>Tyr<br>50  | gat<br>Asp        | act<br>Thr        | atc<br>Ile        | ttt<br>Phe        | acc<br>Thr<br>55  | tca<br>Ser        | aca<br>Thr        | tca<br>Ser             | cta<br>Leu        | gct<br>Ala<br>60  | gac<br>Asp        | ata<br>Ile        | cag<br>Gln        | gct<br>Ala        | 192 |
| gct<br>Ala<br>65             | ttg<br>Leu        | gtg<br>Val        | agc<br>Ser        | ctc<br>Leu        | cag<br>Gln<br>70  | gat<br>Asp        | gct<br>Ala        | gtc<br>Val        | act<br>Thr             | aat<br>Asn<br>75  | ata<br>Ile        | aag<br>Lys        | gat<br>Asp        | aca<br>Thr        | gcg<br>Ala<br>.80 | 240 |
| gct<br>Ala                   | act<br>Thr        | gat<br>Asp        | gag<br>Glu        | gaa<br>Glu<br>85  | acc<br>Thr        | gca<br>Ala        | atc<br>Ile        | gct<br>Ala        | gcg<br>Ala<br>90       | gag<br>Glu        | tgg<br>Trp        | gaa<br>Glu        | act<br>Thr        | aag<br>Lys<br>95  | aat<br>Asn        | 288 |
| gcc<br>Ala                   | gat<br>Asp        | gca<br>Ala        | gtt<br>Val<br>100 | aaa<br>Lys        | gtt<br>Val        | ggc<br>Gly        | gcg<br>Ala        | caa<br>Gln<br>105 | att<br>Ile             | aca<br>Thr        | gaa<br>Glu        | tta<br>Leu        | gcg<br>Ala<br>110 | aaa<br>Lys        | tat<br>Tyr        | 336 |
| gct<br>Ala                   | tcg<br>Ser        | gat<br>Asp<br>115 | aac<br>Asn        | caa<br>Gln        | gcg<br>Ala        | att<br>Ile        | ctt<br>Leu<br>120 | gac<br>Asp        | tct<br>Ser             | tta<br>Leu        | ggt<br>Gly        | aaa<br>Lys<br>125 | ctg<br>Leu        | act<br>Thr        | tcc<br>Ser        | 384 |
| ttc<br>Phe                   | gac<br>Asp<br>130 | ctc<br>Leu        | tta<br>Leu        | cag<br>Gln        | gct<br>Ala        | gct<br>Ala<br>135 | ctt<br>Leu        | ctc<br>Leu        | caa<br>Gl <sub>n</sub> | tct<br>Ser        | gta<br>Val<br>140 | Ala               | aac<br>Asn        | aat<br>Asn        | aac<br>Asn        | 432 |
| aaa<br>Lys<br>145            | gca<br>Ala        | gct<br>Ala        | gag<br>Glu        | ctt<br>Leu        | ctt<br>Leu<br>150 | aaa<br>Lys        | gag<br>Glu        | atg<br>Met        | caa<br>Gln             | gat<br>Asp<br>155 | Asn               | cca<br>Pro        | gta<br>Val        | gtc<br>Val        | cca<br>Pro<br>160 | 480 |
| ggg<br>ggg                   | aaa<br>Lys        | acg<br>Thr        | cct<br>Pro        | gca<br>Ala<br>165 | att<br>Ile        | gct<br>Ala        | caa<br>Gln        | tct<br>Ser        | tta<br>Leu<br>170      | Val               | gat<br>Asp        | cag<br>Gln        | aca<br>Thr        | gat<br>Asp<br>175 | Ala               | 528 |

| aca<br>Thr        | gcg                   | aca<br>Thr         | cag<br>Gln<br>180 | ata<br>Ile        | gag<br>Glu        | aaa<br>Lys        | gat<br>Asp        | gga<br>Gly<br>190 | aat<br>Asn        | gcg<br>Ala        | att<br>Ile        | agg<br>Arg        | gat<br>Asp<br>195 | gca<br>Ala        | tat<br>Tyr        | 576         |
|-------------------|-----------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------|
| ttt<br>Phe        | gca<br>Ala            | gga.<br>Gly<br>200 | cag<br>Gln        | aaç<br>Asn        | gct<br>Ala        | agt<br>Ser        | gga<br>Gly<br>205 | gct<br>Ala        | gta<br>Val        | gaa<br>Glu        | aat<br>Asn        | gct<br>Ala<br>210 | aaa<br>Lys        | tct<br>Ser        | aat<br>Asn        | 62 <u>4</u> |
| aac<br>Asr        | agt<br>Ser<br>215     | ata<br>Ile         | agc<br>Ser        | aac<br>Asn        | ata<br>Ile        | gat<br>Asp<br>220 | tca<br>Ser        | gct<br>Ala        | aaa<br>Lys        | gca<br>Ala        | gca<br>Ala<br>225 | atc<br>Ile        | gct<br>Ala        | act<br>Thr        | gct<br>Ala        | 672         |
| aag<br>Lys<br>230 | aca<br>Thr            | caa<br>Gln         | ata<br>Ile        | gct<br>Ala        | gaa<br>Glu<br>235 | gct<br>Ala        | cag<br>Gln        | aaa<br>Lys        | aag<br>Lys        | ttc<br>Pne<br>240 | ccc<br>Pro        | gac<br>Asp        | tct<br>Ser        | cca<br>Pro        | att<br>Ile<br>245 | 720         |
| Let               | caa<br>Gln            | Glu                | Ala               | Glu<br>250        | Gln               | Met               | Val               | Ile               | Gln<br>255        | Ala               | Glu               | Lys               | Asp               | Leu<br>260        | Lys               | 768         |
| Asi               | atc<br>lle            | Lys                | Pro<br>265        | Ala               | Asp               | Gly               | Ser               | Asp<br>270        | Val               | Pro               | Asn               | Pro               | Gly<br>275        | Thr               | Thr               | 816         |
| gt1<br>Va         | gga<br>Gly            | ggc<br>Gly<br>280  | tcc<br>Ser        | aag<br>Lys        | caa<br>Gln        | caa<br>Gln        | gga<br>Gly<br>285 | agt<br>Ser        | agt<br>Ser        | att<br>Ile        | ggt<br>Gly        | agt<br>Ser<br>290 | att<br>Ile        | cgt<br>Arg        | gtt<br>Val        | 864         |
| tc:<br>Se:        | atg<br>Met<br>295     | ctg<br>Leu         | tta<br>Leu        | gat<br>Asp        | gat<br>Asp        | gct<br>Ala<br>300 | gaa<br>Glu        | aat<br>Asn        | gag<br>Glu        | acc<br>Thr        | gct<br>Ala<br>305 | tcc<br>Ser        | att               | ttg<br>Leu        | atg<br>Mét        | 912         |
| tc<br>Se:<br>31   | o<br>c GJA<br>e aaa   | ttt<br>Phe         | cğt<br>Arg        | cag<br>Gln        | atg<br>Met<br>315 | att<br>Ile        | cac<br>His        | atg<br>Met        | ttc<br>Phe        | aat<br>Asn<br>320 | acg<br>Thr        | gaa<br>Glu        | aat<br>Asn        | cct<br>Pro        | gat<br>Asp<br>325 | 960         |
| tc<br>Se          | caa<br>r Gln          | gct<br>Ala         | gcc<br>Ala        | caa<br>Gln<br>330 | cag<br>Gln        | gag<br>Glu        | ctc<br>Leu        | gca<br>Ala        | gca<br>Ala<br>335 | caa<br>Gln        | gct<br>Ala        | aga<br>Arg        | gca<br>Ala        | gcg<br>Ala<br>340 | aaa<br>Lys        | 1008        |
| gc                | c gct<br>a Ala        | gga<br>Gly         | gat<br>Asp<br>345 | gac               | agt<br>Ser        | gct<br>Ala        | gct<br>Ala        | gca<br>Ala<br>350 | gcg               | ctg<br>Leu        | gca<br>Ala        | gat<br>Asp        | gct<br>Ala<br>355 | cag<br>Gln        | aaa<br>Lys        | 1056        |
| gc<br>Al          | t tta<br>a Leu        | gaa<br>Glu<br>360  | Ala               | gct<br>Ala        | cta<br>Leu        | ggt<br>Gly        | aaa<br>Lys<br>365 | Ala               | Gly<br>aaa        | caa<br>Gln        | caa<br>Gln        | cag<br>Gln<br>370 | Gly               | ata<br>Ile        | ctc<br>Leu        | 1104        |
| aa<br>As          | t gct<br>n Ala<br>375 | Leu                | gga<br>Gly        | cag<br>Gln        | atc<br>Ile        | gct<br>Ala<br>380 | Ser               | gct<br>Ala        | gct<br>Ala        | gtt<br>Val        | gtg<br>Val<br>385 | Ser               | gca<br>Ala        | gga<br>Gly        | gtt<br>Val        | 1152        |
| CC<br>Pr<br>39    | o Pro                 | gct<br>Ala         | gca<br>Ala        | gca<br>Ala        | agt<br>Ser<br>395 | Ser               | ata<br>Ile        | ggg               | tca<br>Ser        | tct<br>Ser<br>400 | Val               | aaa<br>Lys        | cag<br>Gln        | ctt<br>Leu        | tac<br>Tyr<br>405 | 1200        |

aataaataaa aga

| aag<br>Lys        | acc               | tca<br>Ser        | aaa<br>Lys        | tct<br>Ser<br>410 | aca<br>Thr        | ggt<br>Gly        | tct<br>Ser        | gat<br>Asp        | tat<br>Tyr<br>415 | aaa<br>Lys        | aca<br>Thr        | cag<br>Gln        | ata<br>Ile        | tca<br>Ser<br>420 | gca<br>Ala        | 1248  |     |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------|-----|
| ggt<br>Gly        | tat<br>Tyr        | gat<br>Asp        | gct<br>Ala<br>425 | tac<br>Tyr        | aaa<br>Lys        | tcc<br>Ser        | atc<br>Ile        | aat<br>Asn<br>430 | gat<br>Asp        | gcc<br>Ala        | tat<br>Tyr        | ggt<br>Gly        | agg<br>Arg<br>435 | gca<br>Ala        | cga<br>Arg        | 1296  |     |
| aat<br>Asn        | gat<br>Asp        | gcg<br>Ala<br>440 | act<br>Thr        | cgt<br>Arg        | gat<br>Asp        | gtg<br>Val        | ata<br>Ile<br>445 | aac<br>Asn        | aat<br>Asn        | gta<br>Val        | agt<br>Ser        | acc<br>Thr<br>450 | ccc<br>Pro        | gct<br>Ala        | ctc<br>Leu        | 1344  |     |
| aca<br>Thr        | cga<br>Arg<br>455 | tcc<br>Ser        | gtt<br>Val        | cct<br>Pro        | aga<br>Arg        | gca<br>Ala<br>460 | cga<br>Arg        | aca<br>Thr        | gaa<br>Glu        | gct<br>Ala        | cga<br>Arg<br>465 | gga<br>Gly        | cca<br>Pro        | gaa<br>Glu        | aaa<br>Lys        | 1392  |     |
| aca<br>Thr<br>470 | gat<br>Asp        | caa<br>Gln        | gcc<br>Ala        | ctc<br>Leu        | gct<br>Ala<br>475 | agg<br>Arg        | gtg<br>Val        | att<br>Ile        | tct<br>Ser        | ggc<br>Gly<br>480 | aat<br>Asn        | agc<br>Ser        | aga<br>Arg        | act<br>Thr        | ctt<br>Leu<br>485 | 1440  |     |
| <br>gga<br>Gly    | gat<br>Val        | gtc<br>Tyr        | tat<br>Ser        | agt<br>Gln<br>490 | caa<br>Val        | gtt<br>Ser        | tcg<br>Ala        | gca<br>Leu        | cta<br>Gln<br>495 | caa<br>Ser        | tct<br>Val        | gta<br>Met        | atg<br>Gln        | cag<br>Ile<br>500 | atc<br>Ile        | 1488  |     |
| <br>act           | cag<br>Gln        | tcg<br>Ser        | aat<br>Asn<br>505 | cct<br>Pro        | caa<br>Gln        | gcg<br>Ala        | aat<br>Asn        | aat<br>Asn<br>510 | gag<br>Glu        | gag<br>Glu        | atc<br>Ile        | aga<br>Arg        | caa<br>Gln<br>515 | aag<br>Lys        | ctt<br>Leu        | 1536, |     |
| aca<br>Thr        | tcg<br>Ser        | gca<br>Ala<br>520 | gtg<br>Val        | aca<br>Thr        | aag<br>Lys        | cct<br>Pro        | cca<br>Pro<br>525 | cag<br>Gln        | ttt<br>Phe        | ggc<br>Gly        | tat<br>Tyr        | cct<br>Pro<br>530 | tat<br>Tyr        | gtg<br>Val        | caa<br>Gln        | 1584  |     |
| ctt<br>Leu        | tct<br>Ser<br>535 | aat<br>Asn        | gac<br>Asp        | tct<br>Ser        | aca<br>Thr        | cag<br>Gln<br>540 | aag<br>Lys        | ttc<br>Phe        | ata<br>Ile        | gct<br>Ala        | aaa<br>Lys<br>545 | tta<br>Leu        | gaa<br>Glu        | agt<br>Ser        | ttg<br>Leu        | 1632  | ٠.  |
| ttt<br>Phe<br>550 | gct<br>Ala        | gaa<br>Glu        | gga<br>Gly        | tct<br>Ser        | agg<br>Arg<br>555 | aca<br>Thr        | gca<br>Ala        | gct<br>Ala        | gaa<br>Glu        | ata<br>Ile<br>560 | aaa<br>Lys        | gca<br>Ala        | ctt<br>Leu        | tcc<br>Ser        | ttt<br>Phe<br>565 | 1670  | -   |
| gaa<br>Glu        | acg<br>Thr        | aac<br>Asn        | tcc<br>Ser        | ttg<br>Leu<br>570 | ttt<br>Phe        | att<br>Ile        | cag<br>Gln        | cag<br>Gln        | gtg<br>Val<br>575 | ctg<br>Leu        | gtc<br>Val        | aat<br>Asn        | atc               | ддс<br>Gly<br>580 | tct<br>Ser        | 1718  | ,   |
|                   |                   |                   |                   |                   |                   | caa<br>Gln        |                   | caac              | acc               | taag              | tgtt              | cg t              | ttgg              | agag              | a                 | 1769  |     |
| tta               | ttat              | gtg (             | cttt              | ggta              | ag g              | cctt              | tgţt              | g ag              | gcċt              | tacc              | aac               | acac              | tāg               | aacg              | atct              | tc 1  | 829 |

<210> 4

<211> 583

<212> PRT

<213> Chlamydia pneumoniae

<400> 4

Met Ser Leu Ala Asp Lys Leu Gly Ile Ala Ser Ser Asn Ser Ser Ser 1 10 15

Ser Thr Ser Arg Ser Ala Asp Val Asp Ser Thr Thr Ala Thr Ala Pro

Thr Pro Pro Pro Pro Thr Phe Asp Asp Tyr Lys Thr Gln Ala Gln Thr 35 40 45

Ala Tyr Asp Thr Ile Phe Thr Ser Thr Ser Leu Ala Asp Ile Gln Ala
50 55 60

Ala Leu Val Ser Leu Gln Asp Ala Val Thr Asn Ile Lys Asp Thr Ala 65 70 75 80

Ala Thr Asp Glu Glu Thr Ala Ile Ala Ala Glu Trp Glu Thr Lys Asn 85 90 95

Ala Asp Ala Val Lys Val Gly Ala Gln Ile Thr Glu Leu Ala Lys Tyr
100 , 105 110

Ala Ser Asp Asn Gln Ala Ile Leu Asp Ser Leu Gly Lys Leu Thr Ser

Phe Asp Leu Leu Gln Ala Ala Leu Leu Gln Ser Val Ala Asn Asn Asn 130 135 140

Lys Ala Ala Glu Leu Leu Lys Glu Met Gln Asp Asn Pro Val Val Pro 145 150 155 160

Gly Lys Thr Pro Ala Ile Ala Gln Ser Leu Val Asp Gln Thr Asp Ala 165 170 175

Thr Ala Thr Gln Ile Glu Lys Asp Gly Asn Ala Ile Arg Asp Ala Tyr 180 185 190

Phe Ala Gly Gln Asn Ala Ser Gly Ala Val Glu Asn Ala Lys Ser Asn 195 200 205

Asn Ser Ile Ser Asn Ile Asp Ser Ala Lys Ala Ala Ile Ala Thr Ala 210 215 220

Lys Thr Gln Ile Ala Glu Ala Gln Lys Lys Phe Pro Asp Ser Pro Ile 225 230 235 240

Leu Gln Glu Ala Glu Gln Met Val Ile Gln Ala Glu Lys Asp Leu Lys 245 250 255

Asn Ile Lys Pro Ala Asp Gly Ser Asp Val Pro Asn Pro Gly Thr Thr 265 Val Gly Gly Ser Lys Gln Gln Gly Ser Ser Ile Gly Ser Ile Arg Val Ser Met Leu Leu Asp Asp Ala Glu Asn Glu Thr Ala Ser Ile Leu Met Ser Gly Phe Arg Gln Met Ile His Met Phe Asn Thr Glu Asn Pro Asp Ser Gln Ala Ala Gln Gln Glu Leu Ala Ala Gln Ala Arg Ala Ala Lys Ala Ala Gly Asp Asp Ser Ala Ala Ala Ala Leu Ala Asp Ala Gln Lys Ala Leu Glu Ala Ala Leu Gly Lys Ala Gly Gln Gln Gln Gly Ile Leu Asn Ala Leu Gly Gln Ile Ala Ser Ala Ala Val Val Ser Ala Gly Val Pro Pro Ala Ala Ala Ser Ser Ile Gly Ser Ser Val Lys Gln Leu Tyr Lys Thr Ser Lys Ser Thr Gly Ser Asp Tyr Lys Thr Gln Ile Ser Ala 410 405 Gly Tyr Asp Ala Tyr Lys Ser Ile Asn Asp Ala Tyr Gly Arg Ala Arg 425 Asn Asp Ala Thr Arg Asp Val Ile Asn Asn Val Ser Thr Pro Ala Leu 435 Thr Arg Ser Val Pro Arg Ala Arg Thr Glu Ala Arg Gly Pro Glu Lys Thr Asp Gln Ala Leu Ala Arg Val Ile Ser Gly Asn Ser Arg Thr Leu 470 Gly Asp Val Tyr Ser Gln Val Ser Ala Leu Gln Ser Val Met Gln Ile 490 Ile Gln Ser Asn Pro Gln Ala Asn Asn Glu Glu Ile Arg Gln Lys Leu 505 Thr Ser Ala Val Thr Lys Pro Pro Gln Phe Gly Tyr Pro Tyr Val Gln 52C Leu Ser Asn Asp Ser Thr Gln Lys Phe Ile Ala Lys Leu Glu Ser Leu 535 530

| Phe Ala G                             | lu Gly Se                      | r Arg Thr<br>550               | Ala Ala                      | Glu Ile<br>555               | Lys Ala :                | Leu Ser                     | Phe<br>560           |
|---------------------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|--------------------------|-----------------------------|----------------------|
| Glu Thr A                             | sn Ser Le<br>56                |                                | Gln Gln                      | Val Leu<br>570               | Val Asn                  | Ile Gly<br>575              | Ser                  |
| Leu Tyr S                             | er Gly Ty<br>580               | r Leu Gln                      |                              |                              |                          |                             |                      |
| <210> 5 <211> 145 <212> DNA <213> Chl | •                              | eumoniae                       | ·                            |                              |                          |                             |                      |
| <220><br><221> CDS<br><222> (10       | ;<br>(1)(1456                  |                                |                              |                              |                          |                             |                      |
| <400> 5<br>ataaaatct                  | t taaaaac                      | agg ctcgc                      | attaa tt                     | attagtga                     | gagctttt                 | tt tttat                    | ttttt 60             |
| ataataaaa                             | ic taaaaga                     | ttt ttatt                      | atttt tt                     | gagttttt                     | atg gtt<br>Met Val<br>1  | aat cct<br>Asn Pro          | att 115<br>Ile<br>5  |
| ggt cca g<br>Gly Pro G                | 3ly Pro Il                     | a gac gaa<br>e Asp Glu<br>.0   | aca gaa<br>Thr Glu           | cgc aca<br>Arg Thr<br>15     | cct ccc<br>Pro Pro       | gca gat<br>Ala Asp<br>20    | ctt 163<br>Leu       |
| tct gct c<br>Ser Ala G                | caa gga tt<br>Gln Gly Le<br>25 | g gag gcg<br>au Glu Ala        | agt gca<br>Ser Ala<br>30     | Ala Asn                      | aag agt<br>Lys Ser       | gcg gaa<br>Ala Glu<br>35    | gct 211<br>Ala       |
| caa aga a<br>Gln Arg l                | ata gca g<br>Ile Ala G<br>40   | gt gcg gaa<br>ly Ala Glu       | gct aag<br>Ala Lys<br>45     | cct aaa<br>Pro Lys           | gaa tct<br>Glu Ser<br>50 | aag acc<br>Lys Thr          | gat 259<br>Asp       |
| tct gta g<br>Ser Val G<br>55          | gag cga t<br>Glu Arg T         | gg agc atc<br>rp Ser Ile<br>60 | Leu Arc                      | tct gca<br>Ser Ala           | gtg aat<br>Val Asn<br>65 | gct ctc<br>Ala Leu          | atg 307<br>Met       |
| agt ctg s<br>Ser Leu 7                | gca gat a<br>Ala Asp L         | ag ctg ggt<br>ys Leu Gly<br>75 | att gct<br>/ Ile Ala         | tct agt<br>Ser Ser<br>80     | Asn Ser                  | tcg tct<br>Ser Ser          | tct 355<br>Ser<br>85 |
| act agc                               | Arg Ser A                      | ca gac gto<br>la Asp Val<br>90 | g gac tca<br>l Asp Sei       | a acg aca<br>r Thr Thr<br>95 | gcg acc<br>Ala Thr       | gca cct<br>Ala Pro<br>100   | ) IIII               |
| cct cct<br>Pro Pro                    | cca ccc a<br>Pro Pro T<br>105  | cg ttt gat<br>hr Phe Asj       | t gat tal<br>p Asp Ty:<br>11 | r Lys Thi                    | caa gcg<br>Gln Ala       | g caa aca<br>Gln Thi<br>115 | a gct 451<br>r Ala   |

| tac<br>Tyr | gat<br>Asp        | act<br>Thr<br>120 | atc<br>Ile | ttt<br>Phe | acc<br>Thr | tca<br>Ser        | aca<br>Thr<br>125 | tca<br>Ser | cta<br>Leu | gct<br>Ala        | gac<br>Asp        | ata<br>Ile<br>130 | cag<br>Gln        | gct<br>Ala | gct<br>Ala        | 499                |
|------------|-------------------|-------------------|------------|------------|------------|-------------------|-------------------|------------|------------|-------------------|-------------------|-------------------|-------------------|------------|-------------------|--------------------|
| ttg<br>Leu | gtg<br>Val<br>135 | agc<br>Ser        | ctc<br>Leu | cag<br>Gln | Asp        | gct<br>Ala<br>140 | gtc<br>Val        | act<br>Thr | aat<br>Asn | ata<br>Ile        | aag<br>Lys<br>145 | gat<br>Asp        | aca<br>Thr        | gcg<br>Ala | gct<br>Ala        | 547                |
| Thr<br>150 | Asp               | gag<br>Glu        | Glu        | Thr        | Ala<br>155 | Ile               | Ala               | Ala        | Glu        | Trp<br>160        | Glu               | Thr               | Lys               | Asn        | Ala<br>165        | 595                |
| Asp        | Ala               | gtt<br>Val        | Lys        | Val<br>170 | Gly        | Ala               | Gln               | Ile        | Thr<br>175 | Glu               | Leu               | Ala               | Lys               | Tyr<br>180 | Ala               | 643                |
| Ser        | Asp               | aac<br>Asn        | Gln<br>185 | Ala        | Ile        | Leu               | Asp               | Ser<br>190 | Leu        | Gly               | Lys               | Leu               | Thr<br>195        | Ser        | Phe               | 691                |
| Asp        | Leu               | tta<br>Leu<br>200 | Gln        | Ala        | Ala        | Leu               | Leu<br>205        | Gln        | Ser        | Val               | Ala               | Asn<br>210        | naA               | Asn        | Lys               | 739                |
| Ala        | Ala<br>215        | gag<br>Glu        | Leu        | Leu        | Lys        | Glu<br>220        | Met               | Gln        | Asp        | Asn               | Pro<br>225        | Val               | Val               | Pro        | Gly               | . 787 <sub>.</sub> |
| Lys<br>230 | Thr               | cct               | Ala        | Ile        | Ala<br>235 | Gln               | Ser               | Leu        | Val        | Asp<br>240        | Gln               | Thr               | Asp               | Ala        | Thr<br>245        | 835                |
| Ala        | Thr               | cag<br>Gln        | Ile        | Glu<br>250 | Lys        | Asp               | Gly               | Asn        | Ala<br>255 | Ile               | Arg               | Asp               | Ala               | Tyr<br>260 | Phe               | 883                |
| Ala        | Gly               | cag<br>Gln        | Asn<br>265 | Ala        | Ser        | Gly               | Ala               | Val<br>270 | Glu        | Asn               | Ala               | Lys               | <b>Ser</b><br>275 | Asn        | naA               | 931                |
| Ser        | Ile               | agc<br>Ser<br>280 | Asn        | Ile        | Asp        | Ser               | Ala<br>285        | Lys        | Ala        | Ala               | Ile               | Ala<br>290        | Thr               | Ala        | Lys               | 979                |
| Thr        | Gln<br>295        |                   | Ala        | Glu        | Ala        | Gln<br>300        | Lys               | Lys        | Phe        | Pro               | Asp<br>305        | Ser               | Pro               | Ile        | Leu               | 1027               |
| caa        | gaa<br>Glu        | gcg<br>Ala        | gaa<br>Glu | caa<br>Gln | Met        | Val               | ata<br>Ile        | cag<br>Gln | gct<br>Ala | gag<br>Glu<br>320 | ГÀЕ               | gat<br>Asp        | ctt<br>Leu        | aaa<br>Lys | aat<br>Asn<br>325 | 1075               |
| 310        |                   |                   |            |            | 315        |                   |                   |            |            |                   |                   |                   |                   |            | gtt               |                    |

|                   |                                  |                   |                   |                   | •                 |                   |                   |                   | 17/               | 42                |                   |                   |                   |                   |                   |      |
|-------------------|----------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| gga<br>Gly        | ggc<br>Gly                       | tcc<br>Ser        | aag<br>Lys<br>345 | caa<br>Gln        | caa<br>Gln        | gga<br>Gly        | agt<br>Ser        | agt<br>Ser<br>350 | att<br>Ile        | ggt<br>Gly        | agt<br>Ser        | att<br>Ile        | cgt<br>Arg<br>355 | gtt<br>Val        | tcc<br>Ser        | 1171 |
| atg<br>Met        | ctg<br>Leu                       | tta<br>Leu<br>360 | gat<br>Asp        | gat<br>Asp        | gct<br>Ala        | gaa<br>Glu        | aat<br>Asn<br>365 | gag<br>Glu        | acc<br>Thr        | gct<br>Ala        | tcc<br>Ser        | att<br>Ile<br>370 | ttg<br>Leu        | atg<br>Met        | tct<br>Ser        | 1219 |
| gjy<br>aaa        | ttt<br>Phe<br>375                | cgt<br>Arg        | cag<br>Gln        | atg<br>Met        | att<br>Ile        | cac<br>His<br>380 | atg<br>Met        | ttc<br>Phe        | aat<br>Asn        | acg<br>Thr        | gaa<br>Glu<br>385 | aat<br>Asn        | cct<br>Pro        | gat<br>Asp        | tct<br>Ser        | 1267 |
| caa<br>Gln<br>390 | gct<br>Ala                       | gcc<br>Ala        | caa<br>Gln        | cag<br>Gln        | gag<br>Glu<br>395 | ctc<br>Leu        | gca<br>Ala        | gca<br>Ala        | caa<br>Gln        | gct<br>Ala<br>400 | aga<br>Arg        | gca<br>Ala        | gcg<br>Ala        | aaa<br>Lys        | gcc<br>Ala<br>405 | 1315 |
| gct<br>Ala        | gga<br>Gly                       | gat<br>Asp        | gac<br>Asp        | agt<br>Ser<br>410 | gct<br>Ala        | gct<br>Ala        | gca<br>Ala        | gcg<br>Ala        | ctg<br>Leu<br>415 | gca<br>Ala        | gat<br>Asp        | gct<br>Ala        | cag<br>Gln        | aaa<br>Lys<br>420 | gct<br>Ala        | 1363 |
| tta<br>Leu        | gaa<br>Glu                       | gcg<br>Ala        | gct<br>Ala<br>425 | cta<br>Leu        | ggt<br>Gly        | aaa<br>Lys        | gct<br>Ala        | 999<br>Gly<br>430 | caa<br>Gln        | caa<br>Gln        | cag<br>Gln        | ggc<br>Gly        | ata<br>Ile<br>435 | ctc<br>Leu        | aat<br>Asn        | 1411 |
| gct<br>Ala        | tta<br>Leu                       | gga<br>Gly<br>440 | cag<br>Gln        | atc<br>Ile        | gct<br>Ala        | tct<br>Ser        | gct<br>Ala<br>445 | gct<br>Ala        | gtt<br>Val        | gtg<br>Val        | agc<br>Ser        | gca<br>Ala<br>450 | gga<br>Gly        | gta<br>Val        |                   | 1456 |
| <21<br><21        | 0 > 6<br>1 > 4<br>2 > P<br>3 > C | RT                | vdia              | pne               | umon              | iae               |                   |                   |                   |                   | •                 |                   |                   |                   |                   |      |
| < 4 O             | 0> 6<br>Val                      |                   | -                 | <br>-             | Gly               |                   | Gly               | Pro               | Ile<br>10         | Asp               | Glu               | Thr               | Glu               | Arg<br>15         | Thr               |      |

Pro Pro Ala Asp Leu Ser Ala Gln Gly Leu Glu Ala Ser Ala Ala Asn 20

Lys Ser Ala Glu Ala Gln Arg Ile Ala Gly Ala Glu Ala Lys Pro Lys

Glu Ser Lys Thr Asp Ser Val Glu Arg Trp Ser Ile Leu Arg Ser Ala

Val Asn Ala Leu Met Ser Leu Ala Asp Lys Leu Gly Ile Ala Ser Ser

Asn Ser Ser Ser Ser Thr Ser Arg Ser Ala Asp Val Asp Ser Thr Thr 85

Ala Thr Ala Pro Thr Pro Pro Pro Pro Thr Pne Asp Asp Tyr Lys Thr 105 110

| Gln        | Ala        | Gln<br>115 | Thr        | Ala        | Tyr        | Asp        | Thr<br>120 | Ile        | Phe        | Thr        | Ser        | Thr<br>125 | Ser        | Leu        | Ala        |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Asp        | Ile<br>130 | Gln        | Ala        | Ala        | Leu        | Val<br>135 | Ser        | Leu        | Gln        | Asp        | Ala<br>140 | Val        | Thr        | Asn        | Ile        |
| Lys<br>145 | Asp        | Thr        | Ala        | Ala        | Thr<br>150 | Asp        | Glu        | Glu        | Thr        | Ala<br>155 | Ile        | Ala        | Ala        | Glu        | Trp<br>160 |
| Glu        | Thr        | Lys        | Asn        | Ala<br>165 | Asp        | Ala        | Val        | Lys        | Val<br>170 | Gly        | Ala        | Gln        | Ile        | Thr<br>175 | Glu        |
| Leu        | Ala        | Lys        | Tyr<br>180 | Ala        | Ser        | Asp        | Asn        | Gln<br>185 | Ala        | Ile        | Leu        | Asp        | Ser<br>190 | Leu        | Gly        |
| Lys        | Leu        | Thr<br>195 | Ser        | Phe        | Asp        | Leu        | Leu<br>200 | Gln        | Ala        | Ala        | Leu        | Leu<br>205 | Gln        | Ser        | Val        |
| Ala        | Asn<br>210 | Asn        | Asn        | Lys        | Ala        | Ala<br>215 | Glu        | Leu        | Leu        | Lys        | Glu<br>220 | Met        | Gln        | Asp        | Asn        |
| Pro<br>225 | val        | Val        | Pro        | Gly        | Lys<br>230 | Thr        | Pro        | Ala        | Ile        | Ala<br>235 | Gln        | Ser        | Leu        | Val        | Asp<br>240 |
| Gln        | Thr        | Asp        | Ala        | Thr<br>245 | Ala        | Thr        | Gln        | Ile        | Glu<br>250 | Lys        | Asp        | Gly        | Asn        | Ala<br>255 | Ile        |
| Arg        | Asp        | Ala        | Tyr<br>260 | Phe        | Ala        | Gly        | Gln        | Asn<br>265 | Ala        | Ser        | Gly        | Ala        | Val<br>270 | Glu        | Asn        |
| Ala        | Lys        | Ser<br>275 | Asn        | Asn        | Ser        | Ile        | Ser<br>280 | Asn        | Ile        | Asp        | Ser        | Ala<br>285 | Lys        | Ala        | Ala        |
| Ile        | Ala<br>290 | Thr        | Ala        | Lys        | Thr        | Gln<br>295 | Ile        | Ala        | Glu        | Ala        | Gln<br>300 | Lys        | Lys        | Phe        | Pro        |
| Asp<br>305 | Ser        | Pro        | Île        | Leu        | Gln<br>310 | Glu        | Ala        | Glu        | Gln        | Met<br>315 |            | Ile        | Gln        | Ala        | Glu<br>320 |
| Lys        | Asp        | Leu        | Lys        | Asn<br>325 | Ile        | Lys        | Pro        | Ala        | Asp<br>330 |            | Ser        | Asp        | Val        | Pro<br>335 | Asn        |
| Pro        | Gly        | Thr        | Thr<br>340 | Val        | Gly        | Gly        | Ser        | Lys<br>345 | Gln        | Glņ        | Gly        | Ser        | Ser<br>350 | Ile        | Gly        |
| Ser        | .Ile       | Arg<br>355 | Val        | Ser        | Met        | Leu        | Leu<br>360 | Asp        | Asp        | Ala        | Glu        | Asn<br>365 | Glu        | Thr        | Ala        |
| Ser        | 11e<br>370 |            | Met        | Ser        | Gly        | Phe<br>375 |            | Gln        | Met        | Ile        | His<br>380 |            | Phe        | Asn        | Thr        |
| Glu<br>385 |            | Pro        | Asp        | Ser        | Gln<br>390 |            | Ala        | Gln        | Gln        | Glu<br>395 |            | Ala        | Ala        | Gln        | Ala<br>400 |

Arg Ala Ala Lys Ala Ala Gly Asp Asp Ser Ala Ala Ala Ala Leu Ala
405 410 415

Asp Ala Gln Lys Ala Leu Glu Ala Ala Leu Gly Lys Ala Gly Gln Gln
420 425 430

Gln Gly Ile Leu Asn Ala Leu Gly Gln Ile Ala Ser Ala Ala Val Val 435 440 445

Ser Ala Gly Val 450

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<220>

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ggccgtggta atttataaa gttttggtc gcccaagcaa ttgctgctaa ctatgatcct 480

aaagaggcta atggtttac aaattataaa ggatttccg ctctatatat gtatggcatc 540

acagattctc tatcattcag agcttatggg gcttactcca aaccagcaaa cgataaactc 600

ggcagtgatt ttacttccg aaagtttgat ctaggtataa tttcagcgtt ttaagtcaaa 660

ttttaataaa atcttaaaa gattttatt atttttggg ttttt atg gtt aat cct 777

att ggt cca ggt cct ata gac gaa aca gaà cgc aca cct ccc gca gat 825

Ile Gly Pro Gly Pro Ile Asp Glu Thr Glu Arg Thr Pro Pro Ala Asp

5 10 15 20

Met Val Asn Pro

| ctt<br>Leu             | Ser                   | Ala        | Gln        | Gly<br>25  | Leu        | Glu               | Ala        | Ser                 | Ala<br>30    | Ala            | Asn                | Lys               | Ser        | 35         | Glu            | 873  |
|------------------------|-----------------------|------------|------------|------------|------------|-------------------|------------|---------------------|--------------|----------------|--------------------|-------------------|------------|------------|----------------|------|
| Ala                    | Gln                   | Arg        | Ile<br>40  | Ala        | Gly        | Ala               | Glu        | Ala<br>45           | ГУБ          | Pro            | Lys                | gaa<br>Glu        | Ser<br>50  | Lys        | Thr            | 921  |
| Asp                    | Ser                   | Val<br>55  | Glu        | Arg        | Trp        | Ser               | Ile<br>60  | Leu                 | Arg          | Ser            | Ala                | gtg<br>Val<br>65  | Asn        | Ala        | Leu            | 969  |
| Met                    | Ser<br>70             | Leu        | Ala        | Asp        | Lys        | Leu<br>75         | Gly        | Ile                 | Ala          | Ser            | Ser<br>80          | aac<br>Asn        | ser        | ser        | ser            | 1017 |
| Ser<br>85              | Thr                   | Ser        | Arg        | Ser        | Ala<br>90  | Asp               | Val        | Asp                 | Ser          | Thr<br>95      | Thr                | gcg<br>Ala        | Thr        | Ala        | Pro<br>100     | 1065 |
| Thr                    | Pro                   | Pro        | Pro        | Pro<br>105 | Thr        | Phe               | Asp        | Asp                 | Tyr<br>110   | Lys            | Thr                | caa<br>Gln        | Ala        | Gln<br>115 | Thr            | 1113 |
| Ala                    | Tyr                   | Asp        | Thr        | Ile        | Phe        | Thr               | Ser        | Thr<br>125          | Ser          | Leu            | Ala                | Asp               | 11e.       | Gln        | Ala            | 1161 |
| Ala                    | Leu                   | Val<br>135 | Ser        | Ļeu        | Gln        | Asp               | Ala<br>140 | Val                 | Thr          | Asn            | Ile                | aag<br>Lys<br>145 | Asp        | Thr        | Ala            | 1209 |
| Ala                    | Thr<br>150            | Asp        | Glu        | Glu        | Thr        | Ala<br>155        | Ile        | Ala                 | Ala          | Glu            | Trp<br>160         |                   | Thr        | Lys        | Asn            | 1257 |
| Ala<br>165             | Asp                   | Ala        | Val        | Lys        | Val<br>170 | Gly               | Ala        | . Gl <sub>i</sub> n | Ile          | 175            | Glu                | tta<br>Leu        | Ala        | Lys        | 180            | 1305 |
| Ala                    | Ser                   | Asp        | Asn        | 185        | Ala        | Ile               | Leu        | Asp                 | Ser<br>190   | Leu<br>I       | Gly                | . aaa<br>Lys      | . Leu      | Thr<br>195 | Ser            | 1353 |
| Phe                    | . Asp                 | Leu        | Lev<br>200 | Glr        | Ala        | Ala               | Lev        | 205                 | ı Glr        | ı Ser          | · Val              |                   | 210        | Asn        | n Asn          | 1401 |
| Lys                    | Ala                   | 215        | Gli        | ı Lev      | ı Lev      | Lys               | 220        | ı Met               | : Gl:        | a Asp          | ) Ası              | 225               | Val        | . Val      | c cca<br>l Pro | 1449 |
| Gl <sup>y</sup><br>aaa | g aaa<br>/ Lys<br>230 | Thi        | g cct      | gea<br>Ala | a att      | get<br>Ala<br>235 | a Gli      | a tci<br>n Sei      | tta<br>r Lei | a gti<br>u Vai | gai<br>l Asj<br>24 | o Gln             | aca<br>Thr | gat<br>Asp | gct<br>Ala     | 1497 |

| aca<br>Thr<br>245 | gcg<br>Ala        | aca<br>Thr        | cag<br>Gln        | ata<br>Ile        | gag<br>Glu<br>250 | aaa<br>Lys        | gat<br>Asp        | gga<br>Gly        | aat<br>Asn        | gcg<br>Ala<br>255 | att<br>Ile        | agg<br>Arg        | gat<br>Asp        | gca<br>Ala        | tat<br>Tyr<br>260 | 1545  |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------|
| ttt<br>Phe        | gca<br>Ala        | gga<br>Gly        | cag<br>Gln        | aac<br>Asn<br>265 | gct<br>Ala        | agt<br>Ser        | gga<br>Gly        | gct<br>Ala        | gta<br>Val<br>270 | gaa<br>Glu        | aat<br>Asn        | gct.<br>Ala       | aaa<br>Lys        | tct<br>Ser<br>275 | aat<br>Asn        | 1593  |
| aac<br>Asn        | agt<br>Ser        | ata<br>Ile        | agc<br>Ser<br>280 | aac<br>Asn        | ata<br>Ile        | gat<br>Asp        | tca<br>Ser        | gct<br>Ala<br>285 | aaa<br>Lys        | gca<br>Ala        | gca<br>Ala        | atc<br>Ile        | gct<br>Ala<br>290 | act<br>Thr        | gct<br>Ala        | 1641  |
| aag<br>Lys        | aca<br>Thr        | caa<br>Gln<br>295 | ata<br>Ile        | gct<br>Ala        | gaa<br>Glu        | gct<br>Ala        | cag<br>Gln<br>300 | aaa<br>Lys        | aag<br>Lys        | ttc<br>Phe        | ccc<br>Pro        | gac<br>Asp<br>305 | tct<br>Ser        | cca<br>Pro        | att<br>Ile        | 1689  |
| ctt<br>Leu        | caa<br>Gln<br>310 | gaa<br>Glu        | gcg<br>Ala        | gaa<br>Glu        | caa<br>Gln        | atg<br>Met<br>315 | gta<br>Val        | ata<br>Ile        | cag<br>Gln        | gct<br>Ala        | gag<br>Glu<br>320 | aaa<br>Lys        | gat<br>Asp        | ctt<br>Leu        | aaa<br>Lys        | 1737  |
| aat<br>Asn<br>325 | atc<br>Ile        | aaa<br>Lys        | cct<br>Pro        | gca<br>Ala        | gat<br>Asp<br>330 | ggt<br>Gly        | tct<br>Ser        | gat<br>Asp        | gtt<br>Val        | cca<br>Pro<br>335 | aat<br>Asn        | cca<br>Pro        | gga<br>Gly        | act<br>Thr        | aca<br>Thr<br>340 | 1785  |
| gtt<br>Val        | gga<br>Gly        | ggc<br>Gly        | tcc<br>Ser        | aag<br>Lys<br>345 | caa<br>Gln        | caa<br>Gln        | gga<br>Gly        | agt<br>Ser        | agt<br>Ser<br>350 | att<br>Ile        | ggt<br>Gly        | agt<br>Ser        | att<br>Ile        | cgt<br>Arg<br>355 | gtt<br>Val        | .1833 |
| tcc<br>Ser        | atg<br>Met        | ctg<br>Leu        | tta<br>Leu<br>360 | gat<br>Asp        | gat<br>Asp        | gct<br>Ala        | gaa<br>Glu        | aat<br>Asn<br>365 | gag<br>Glu        | acc<br>Thr        | gct<br>Ala        | tcc<br>Ser        | att<br>Ile<br>370 | ttg<br>Leu        | atg<br>Met        | 1881  |
| tct<br>Ser        | ggg<br>Gly        | ttt<br>Phe<br>375 | .cgt<br>Arg       | cag<br>Gln        | atg<br>Met        | att<br>Ile        | cac<br>His<br>380 | atg<br>Met        | ttc<br>Phe        | aat<br>Asn        | acg<br>Thr        | gaa<br>Glu<br>385 | aat<br>Asn        | cct<br>Pro        | gat<br>Asp        | 1929  |
| tct<br>Ser        | caa<br>Gln<br>390 | gct<br>Ala        | gcc<br>Ala        | caa<br>Gln        | cag<br>Gln        | gag<br>Glu<br>395 | ctc<br>Leu        | gca<br>Ala        | gca<br>Ala        | caa<br>Gln        | gct<br>Ala<br>400 | aga<br>Arg        | gca<br>Ala        | gcg<br>Ala        | aaa<br>Lys        | 1977  |
| gcc<br>Ala<br>405 | gct<br>Ala        | gga<br>Gly        | gat<br>Asp        | gac<br>Asp        | agt<br>Ser<br>410 | gct<br>Ala        | gct<br>Ala        | gca<br>Ala        | gcg<br>Ala        | ctg<br>Leu<br>415 | gca<br>Ala        | gat<br>Asp        | gct<br>Ala        | cag<br>Gln        | aaa<br>Lys<br>420 | 2025  |
| gct<br>Ala        | tta<br>Leu        | gaa<br>Glu        | gcg<br>Ala        | gct<br>Ala<br>425 | cta<br>Leu        | ggt<br>Gly        | aaa<br>Lys        | gct<br>Ala        | 999<br>Gly<br>430 | caá<br>Gln        | caa<br>Gln        | cag<br>Gln        | ggc               | ata<br>Ile<br>435 | ctc<br>Leu        | 2073  |
| aat<br>Asn        | gct<br>Ala        | tta<br>Leu        | gga<br>Gly<br>440 | cag<br>Gln        | atc<br>Ile        | gct<br>Ala        | tct<br>Ser        | gct<br>Ala<br>445 | Ala               | gtt<br>Val        | gtg<br>Val        | agc<br>Ser        | gca<br>Ala<br>450 | gga<br>Gly        | gta<br>Val        | 2121  |

ctc ccg ctg cag caa gtt cta tgg atc cga gct cgg tac caa gct tac Leu Pro Leu Gln Gln Val Leu Trp Ile Arg Ala Arg Tyr Gln Ala Tyr 460. gta gaa caa aaa ctc atc tca gaa gag gat ctg aat agc gcc gtc gac Val Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn Ser Ala Val Asp 475 2238 cat cat cat cat cat tga His His His His His <210> 8 <211> 490 <212> PRT <213> Chlamydia pneumoniae <400> 8 Met Val Asn Pro Ile Gly Pro Gly Pro Ile Asp Glu Thr Glu Arg Thr Pro Pro Ala Asp Leu Ser Ala Gln Gly Leu Glu Ala Ser Ala Ala Asn Lys Ser Ala Glu Ala Gln Arg Ile Ala Gly Ala Glu Ala Lys Pro Lys 40 Glu Ser Lys Thr Asp Ser Val Glu Arg Trp Ser Ile Leu Arg Ser Ala Val Asn Ala Leu Met Ser Leu Ala Asp Lys Leu Gly Ile Ala Ser Ser Asn Ser Ser Ser Ser Thr Ser Arg Ser Ala Asp Val Asp Ser Thr Thr 90 Ala Thr Ala Pro Thr Pro Pro Pro Pro Thr Phe Asp Asp Tyr Lys Thr 105 100 Gln Ala Gln Thr Ala Tyr Asp Thr Ile Phe Thr Ser Tnr Ser Leu Ala 120 Asp Ile Gln Ala Ala Leu Val Ser Leu Gln Asp Ala Val Thr Asn Ile 140 135 Lys Asp Thr Ala Ala Thr Asp Glu Glu Thr Ala Ile Ala Ala Glu Trp 150 Glu Thr Lys Asn Ala Asp Ala Val Lys Val Gly Ala Gln Ile Thr Glu 170 Leu Ala Lys Tyr Ala Ser Asp Asn Gln Ala Ile Leu Asp Ser Leu Gly 180



Lys Leu Thr Ser Phe Asp Leu Leu Gln Ala Ala Leu Leu Gln Ser Val Ala Asn Asn Asn Lys Ala Ala Glu Leu Leu Lys Glu Met Gln Asp Asn Pro Val Val Pro Gly Lys Thr Pro Ala Ile Ala Gln Ser Leu Val Asp Gln Thr Asp Ala Thr Ala Thr Gln Ile Glu Lys Asp Gly Asn Ala Ile Arg Asp Ala Tyr Phe Ala Gly Gln Asn Ala Ser Gly Ala Val Glu Asn Ala Lys Ser Asn Asn Ser Ile Ser Asn Ile Asp Ser Ala Lys Ala Ala 280 Ile Ala Thr Ala Lys Thr Gln Ile Ala Glu Ala Gln Lys Lys Phe Pro 295 Asp Ser Pro Ile Leu Gln Glu Ala Glu Gln Met Val Ile Gln Ala Glu 310 305 Lys Asp Leu Lys Asn Ile Lys Pro Ala Asp Gly Ser Asp Val Pro Asn 325 .... 330 Pro Gly Thr Thr Val Gly Gly Ser Lys Gln Gln Gly Ser Ser Ile Gly 340 Ser Ile Arg Val Ser Met Leu Leu Asp Asp Ala Glu Asn Glu Thr Ala Ser Ile Leu Met Ser Gly Phe Arg Gln Met Ile His Met Phe Asn Thr Glu Asn Pro Asp Ser Gln Ala Ala Gln Glu Leu Ala Ala Gln Ala 390 385 Arg Ala Ala Lys Ala Ala Gly Asp Asp Ser Ala Ala Ala Leu Ala Asp Ala Gln Lys Ala Leu Glu Ala Ala Leu Gly Lys Ala Gly Gln Gln Gln Gly Ile Leu Asn Ala Leu Gly Gln Ile Ala Ser Ala Ala Val Val Ser Ala Gly Val Leu Pro Leu Gln Gln Val Leu Trp Ile Arg Ala Arg 455 Tyr Gln Ala Tyr Val Glu Gln Lys Leu Île Ser Glu Glu Asp Leu Asn

<400> 13

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## 21/22

| Ser | Ala | Val | Asp | His | His | His | His | His | His |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     |     |     | 485 |     |     |     |     | 490 |

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|        |          | .~         |              |            |     |   |      |
| <213>  | DITIME   | = L .      |              |            |     |   |      |
|        | _        |            |              |            |     |   |      |
| <400>  | 9        |            | •            |            |     |   |      |
|        |          |            |              |            |     |   | 4.5  |
| ataaga | aatgc    | ggccgccacc | atggttaatc   | ctattggtcc | agg |   | 43   |
|        |          |            | 4            |            |     |   |      |
|        |          |            |              |            |     |   |      |
| <210>  | 10       |            |              |            | •   |   |      |
| <211>  |          |            |              |            |     |   |      |
| <212>  |          | ,          | •            |            |     |   |      |
| <213>  |          | .~         |              |            |     |   |      |
| <213>  | ĎΣΤιιι   | -L .       |              |            |     |   | •    |
|        |          |            |              |            |     |   |      |
| <400>  | 10       |            |              |            |     |   |      |
|        |          |            |              |            |     |   | 35   |
| gcgccg | ggatc    | ccttggagat | : aaccagaata | tagag      |     |   | 35   |
|        |          |            |              |            |     |   |      |
|        |          |            |              |            |     |   |      |
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| <213>  |          | ar         |              |            |     |   |      |
| ~213/  | P        | ,          |              |            |     |   |      |
| .400-  | 11       | * '        |              |            |     |   |      |
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| ataag  | aatgc    | ggccgccacc | atgagtctgg   | Cagacaagec | 999 |   | . 40 |
|        |          | •          | •            |            |     |   |      |
|        |          |            | •            |            |     |   |      |
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|        | <u>r</u> | _          |              |            |     |   | •    |
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| (400)  |          |            |              |            |     |   |      |
| ~~~~   | aas ta   | cattagagat | - aaccacaata | ta         |     |   | 3.2  |
| gegee  | ggatc    | cettggagai | t aaccagaata |            |     |   |      |
|        |          |            | •            |            |     |   |      |
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